

## ABSTRACT OF THE DISCLOSURE

A polymer electrolyte fuel cell includes a high-temperature portion and a low-temperature portion in a cell plane. The fuel cell includes an oxidant gas passage  
5 where an oxidant gas flows. An oxidant gas flow is directed from the high-temperature portion to the low-temperature portion of the cell so that water generated during operation recirculates in the oxidant gas passage to permit self-humidification of the fuel cell.